HYDRONIC COMPONENTS INC

Quote Number:

Submittal

Job Name:

Buy Sell Rep:

Date:

Contacts

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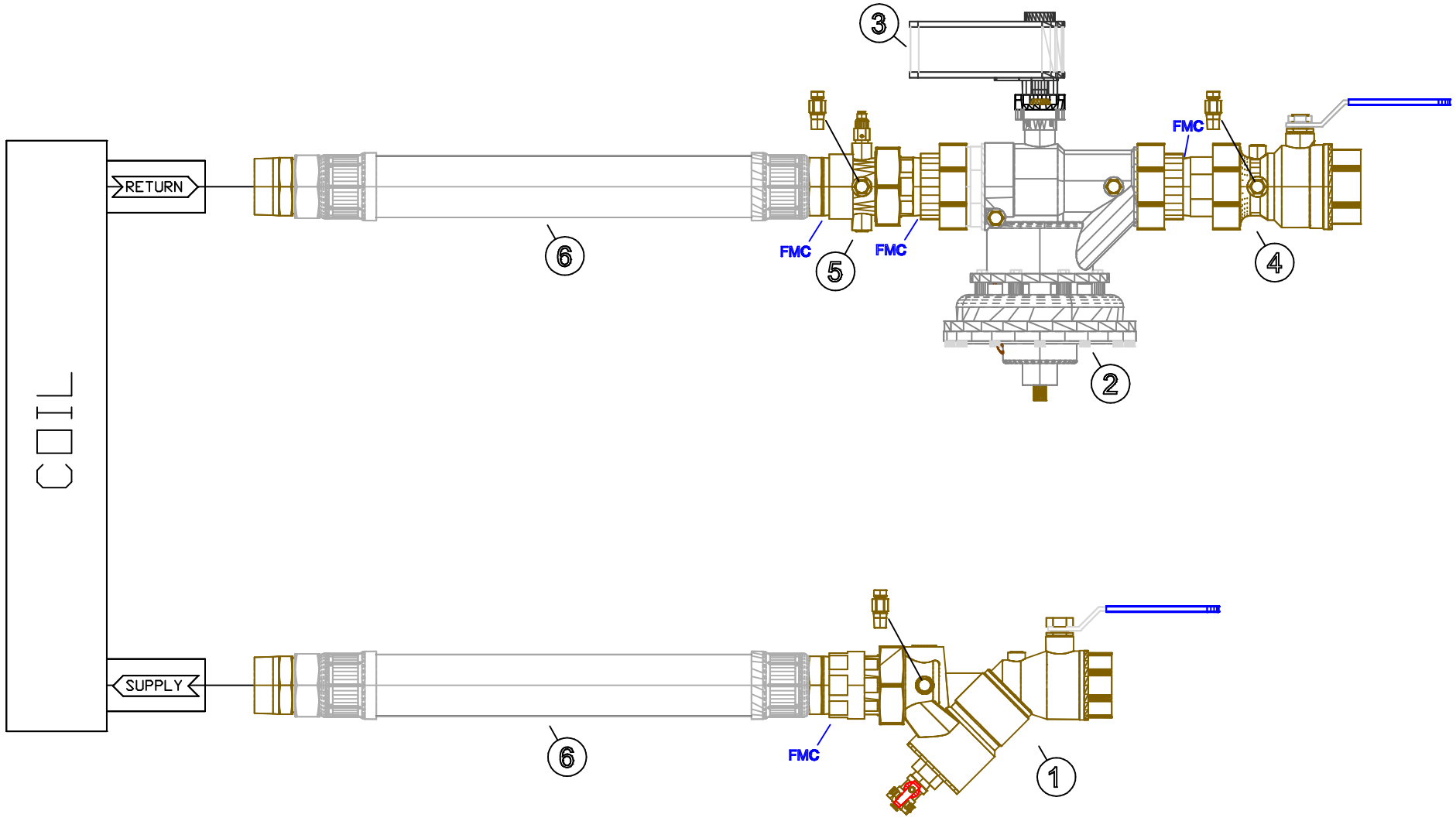


1. TY - Y-strainer, Union, Ball Valve w/ PT and Drain
2. T85 - Pressure Independent Control Valve (PICV)
3. VA - Actuator
4. NT - Ball Valve, Union w/ PT
5. TU - Union w/ PT and Manual Air Vent
6. HC - Flex Hose

FMC - Joint made by Manufacturer, 100% pressure tested

HCI
PETTINAROLI HYDRONICS USA

This document cannot be used by others for any purpose, without prior written consent

Title: 2YUP850-QVHL+JCIL

HCI
32853 Edward Ave.
Madison Heights, MI 48071
P: 586-268-1640 F: 586-979-8318
www.hciterminator.com

Plant:

Date: 8/9/2021

Graphic scale: DRAWING NOT TO SCALE

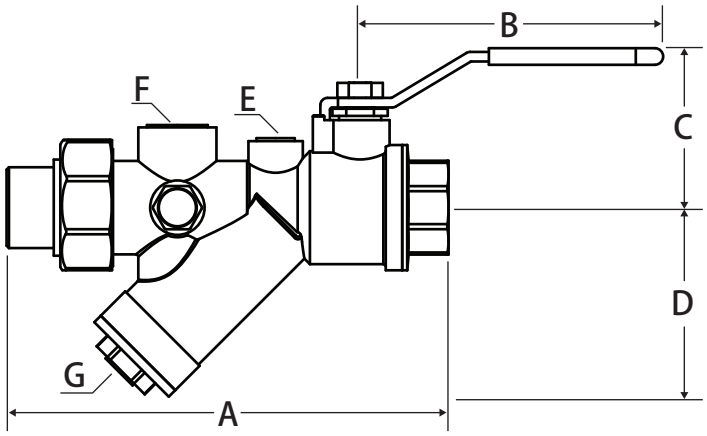
Client ref.

Combination Strainer Valve

Y-Strainer • Isolation Ball Valve • 20 Mesh Strainer with Union and PT Port • 600 WOG

* Shown with optional blowdown drain.

TY



DIRECTION OF FLOW

Features

- Three additional accessory tap
- Triple sealing stem with 2 Viton® o-rings and Teflon® seal
- Blow out proof stem
- 100% leak tested

Pressure and Temperature Rating

- 600 WOG
- 325°F Max

Smart Part Number Ordering Guide

TY-CF2RM-QX

TY	C	F	2RM	Q	X

Valve Size

A	1/2"
B	3/4"
C	1"
D	1-1/4"
E	1-1/2"
F	2"

Body Type

F	FNPT
C	SWT

Tailpiece Size and Type

No Reduction	
F	FNPT
M	MNPT
C	SWT
Single Reduction*	
RF	FNPT
RM	MNPT
RC	SWT
Double Reduction**	
2RF	FNPT
2RM	MNPT
2RC	SWT

*Only available on 3/4" - 2" valves
**Only available on 1" - 2" valves

Optional

Optional Accessories

X	Extended Handle, PT Ports, and Accessories
V	Manual Air Vent
B	Ball Valve Air Vent
Q	Blowdown / Drain

Material Specifications

Part	Material
Body	Brass -CW617N
End Connection	Brass -CW617N
Ball	Chrome Plated Brass -CW617N
Seat (2)	PTFE
Stem	Brass -CW617N
Packing	PTFE
Stem O-ring (2)	Viton®
Packing Gland	Brass -CW617N
Handle	Steel - Zinc Plated
Handle Nut	Brass -CW617N
Service Cap	Brass -CW617N
Service Cap O-ring	Viton®
Strainer	304 Stainless Steel
Union Gasket	EPDM
Tailpiece	Brass -CW617N
Union Nut	Brass -CW617N

Dimensions

Size	A*	B	C	D	E	F	G	Cv
1/2"	5.03	3.40	1.70	1.60	0.25	0.50	0.25	5.50
3/4"	5.88	3.40	1.80	2.40	0.25	0.50	0.25	9.00
1"	6.25	3.40	1.80	2.40	0.25	0.50	0.25	9.00
1-1/4"	7.88	4.40	2.50	3.50	0.25	0.75	0.25	28.00
1-1/2"	8.00	4.40	2.50	3.50	0.25	0.75	0.25	28.00
2"	10.31	5.50	3.50	4.50	0.25	0.75	0.50	32.00

*Length is for a SWT x FNPT valve, additional dimensions available upon request

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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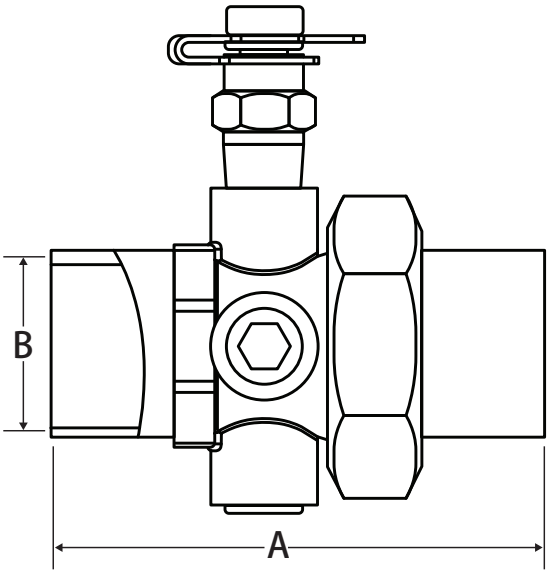
Hydronic Union

600 WOG

TU



DIRECTION OF FLOW

Features

- Pressure / temperature (PT) test ports
- Additional accessory taps
- 100% leak tested

Pressure and Temperature Rating

- 600 WOG
- 325°F Max

Smart Part Number Ordering Guide

TU-AFC-QV

TU | **A** | **F** | **C** | **Q** | **V**

Valve Size

A	1/2"
B	3/4"
C	1"
D	1-1/4"
E	1-1/2"
F	2"

Body Type

F	FNPT
C	SWT

Tailpiece Size and Type

No Reduction

F	FNPT
M	MNPT
C	SWT

Single Reduction*

RF	FNPT
RM	MNPT
RC	SWT

Double Reduction**

2RF	FNPT
2RM	MNPT
2RC	SWT

*Only available on 3/4" - 2" valves
**Only available on 1" - 2" valves

Optional

Optional Accessories

X	Extended PT Port / Accessories
V	Manual Air Vent
B	Ball Valve Air Vent
Q	Blowdown / Drain

Material Specifications

Part	Material
Body	Brass - CW617N
O-ring	EPDM
Tail Piece	Brass - CW617N
Union Nut	Brass - CW617N

Dimensions

Size	A	B
1/2"	2.30	0.63
3/4"	3.10	0.88
1"	3.28	1.13
1-1/4"	3.99	1.38
1-1/2"	3.86	1.63
2"	4.65	2.13

Note: Dimensions for a SWT x SWT valve, additional dimensions available upon request

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VA9300 Series Electric Non-Spring Return Valve Actuators

Product Bulletin

VA9308,VA9310, VA9316,
VA9320,VA9335

Code No. LIT-12012265
Issued July 2019

The VA9300 Series Electric Non-Spring Return Actuators are direct mount actuators for valves with ISO Flange mounting such as the VG1000 Series Valves.

The series consists of models with on/off and floating controls as well as models with Automatic Signal Input Detection which allows automatic recognition of input signals for on/off, floating, and proportional control.

An optional line voltage auxiliary switch kit can be field installed to indicate an end-stop position or perform switching functions within the selected rotation range. The VA9300 Actuators also feature a NEMA 4X weathershield for applications in harsh environments.

Figure 1: VA9300 Series Electric Non-Spring Return Actuator

Table 1: Features and Benefits (Part 1 of 2)

Features	Benefits
Models with Automatic Signal Input Detection, On/Off, Floating, and Proportional Control with Adjustable Span and Offset	Increases availability at distributors and simplifies retrofits.
Line Voltage On/Off and Floating Modules	Reduces total installation cost by avoiding the installation of external supply adapters.
High Speed On/Off and Floating Models	Allows applications in loops that require a quick response time.
Easy Conversion to Valve Operation—Same Actuator Used for Dampers or Valves	Increases availability at distributors with only one actuator to learn.
Optional Accessory Kit	Increases availability at distributors. The auxiliary switch kit provides two line-voltage-capable single-pole, double-throw (SPDT) switches with continuously adjustable switch points, and the auxiliary potentiometer kit provides several potentiometer feedback options. Facilitates safety interfacing or signaling.
Backward Compatible Auxiliary Switch Kits and Auxiliary Potentiometer	Allows for a seamless retrofit without the need to replace the controller.
Self-Calibrating Input Signal to Adjust Stroke	Eliminates the need for a complex calibration procedure when adjusting stops.

Table 1: Features and Benefits (Part 2 of 2)

Features	Benefits
Electronic Stall Detection	Protects from overload at all angles of rotation. The actuator may be stalled anywhere in its rotation range without the need for mechanical end switches.
Microprocessor-Controlled Brushless DC Motor	Provides constant runtime independent of torque and increases lifecycle by reducing wear.
Mode Configuration Switches	Permits calibration, input signal range selection, and control logic reversal for proportional control.
Integral Cables with Colored and Numbered Conductors	Simplify installation and field wiring.
Optional Integral 1/2 in. (13 mm) Threaded Conduit Connectors	Simplify installation and field wiring.
Plenum-Rated Models	Enable use in other environmental air spaces (plenums) in accordance with section 300.22(C) of the National Electric Code.
Small Footprint	Allows application in smaller spaces than the M9106/M9109 and M9108 Actuators.
M9106, M9109, and M9108 Series Actuators Replacement	Simplifies product selection and logistics.
Position Indicator Handle	Allows intuitive indication of valve position.
Same Weathershield as VA9203 and VA9208 Series Actuators	Keeps logistics simple and assures quick delivery time.
NEMA5/IP54 Enclosure	Enhances the range of application environments.
Underwriters Laboratories Inc.® (UL), CE Mark, and RCM Compliance	Provides internationally recognized regulatory agency approvals.
Manufactured under International Standards Organization (ISO) 9001 Quality Control Standards	Ensures quality.
100,000 Cycles and 2.5 Million Repositions	Assure long time reliability.
5-Year Warranty	Protects consumer investment.

Product Details

Models with Automatic Input Detection (VA93xx-HGA-2)

The actuators operate with AC/DC 24 V to provide 90 lb·in. (10 N·m) rated torque and are designed to be used with on/off, floating, or proportional controls in HVAC. They have a 90-second constant runtime, independent of supply voltage frequency and load. When the actuator is in proportional mode, it responds to DC 0 to 10 V or DC 2 to 10 V control signals. With the addition of a 500 ohm resistor, the actuator responds to a 0 to 20 mA or 4 to 20 mA signal. A DC 0 to 10 V or DC 2 to 10 V feedback signal indicates position. See Figure 2 through Figure 9 for floating and on/off control.

The actuators include plenum-rated cables and are specially configured for installation in spaces used for environmental air-handling purposes, other than ducts and plenums, as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air.

Floating and On/Off Models for Line Voltage (AC 85 to 264 V) for Standard Speed (VA93xx-AUA-2)

The actuators have a 90-second constant runtime, independent of supply voltage frequency and load and they provide 90 lb·in. (10 N·m) rated torque. They are designed to be used with on/off or floating controls in HVAC systems. The actuators include halogen free appliance cable.

Floating and On/Off Models for AC/DC 24 V for High Speed (VA9308-AUA-2Z)

The actuators have an 8-second constant runtime, independent of supply voltage frequency and load and they provide 70 lb·in. (8 N·m) rated torque. They are designed to be used with on/off or floating controls in HVAC systems. The actuators include halogen free appliance cable.

Floating and On/Off Models for AC/DC 24 V for High Speed (VA9308-AGA-2Z)

The actuators have an 8-second constant runtime, independent of supply voltage frequency. They are designed to be used with on/off or floating controls in HVAC systems. The actuators include plenum-rated cables and are specially configured for installation in spaces used for environmental air-handling purposes, other than ducts and plenums, as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air.

Figure 1: VA93xx-AGA-xx wiring diagrams

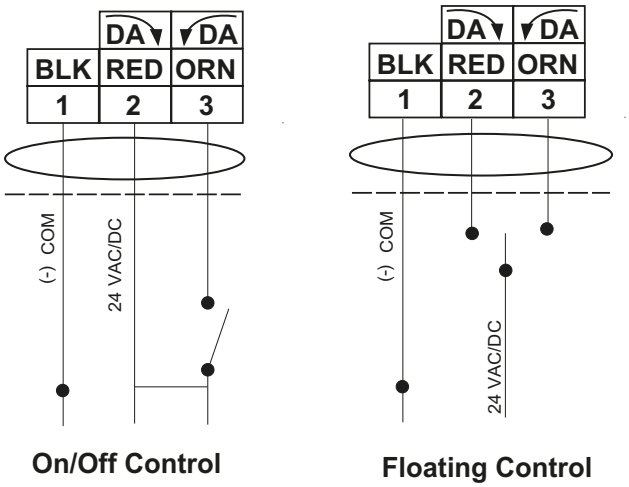


Figure 1: VA93xx-AUA-2x wiring diagrams

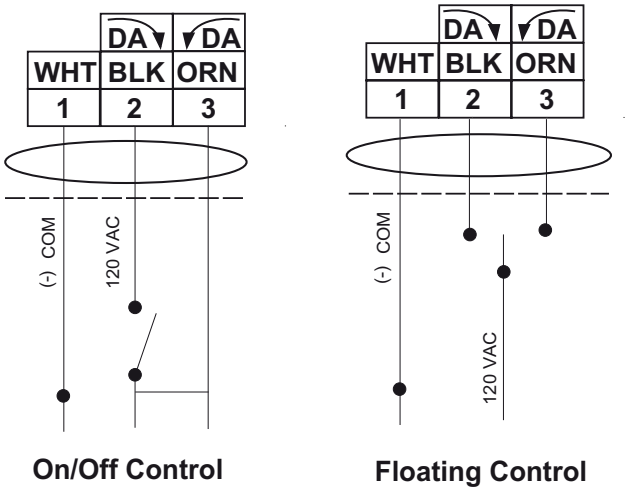


Figure 2: VA93xx-HGA-x

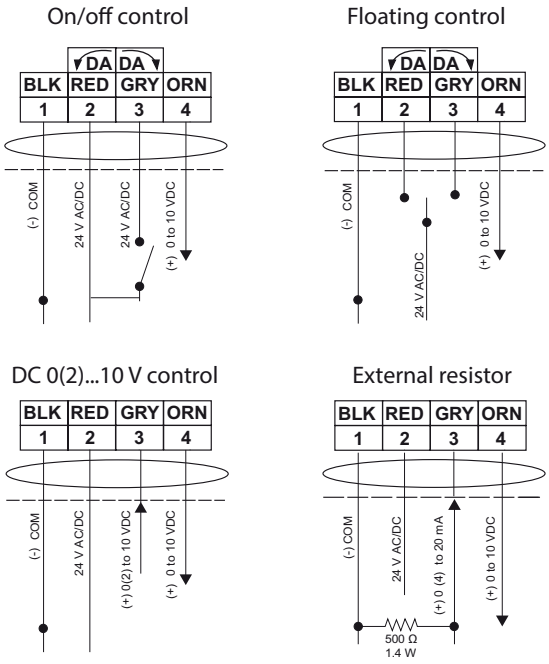
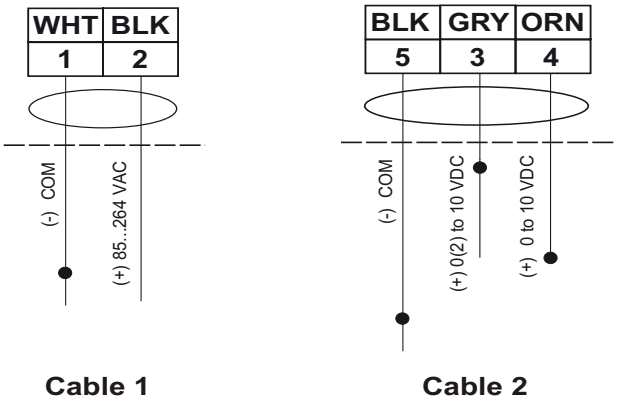


Figure 3: VA93xx-GUA-x



IMPORTANT: Use this VA9300 Series Electric Non-Spring Return Valve Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the electric actuator.

IMPORTANT : Utiliser ce VA9300 Series Electric Non-Spring Return Valve Actuator uniquement pour commander des équipements dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du electric actuator risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du electric actuator.

Operation

VA9300 Series Actuators use a brushless DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The actuator slows down before it reaches its stop position minimizing the impact on the gearbox, further reducing gear wear. The microprocessor also monitors the brushless DC motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches.

Auto-Calibration Mode (VA9310-HGA-2)

The actuator self-calibrates the control signal when an end stop is adjusted on the stroke. An auto-calibration has to be performed to change the feedback of the actuator. The auto-calibration mode identifies the available range of travel of the coupler. During the auto-calibration mode, the actuator moves the coupler to the maximum and minimum end stops to identify the range of travel.

DIP Switches and Status LEDs

The actuators allow easy setting of the input signals. Through the DIP switches located under the removable oval cover in the front of the unit, it is possible to set reverse or direct acting and to select 0 to 10 V or 2 to 10 V input or other starting points and spans.

Figure 4: DIP Switches and LEDs

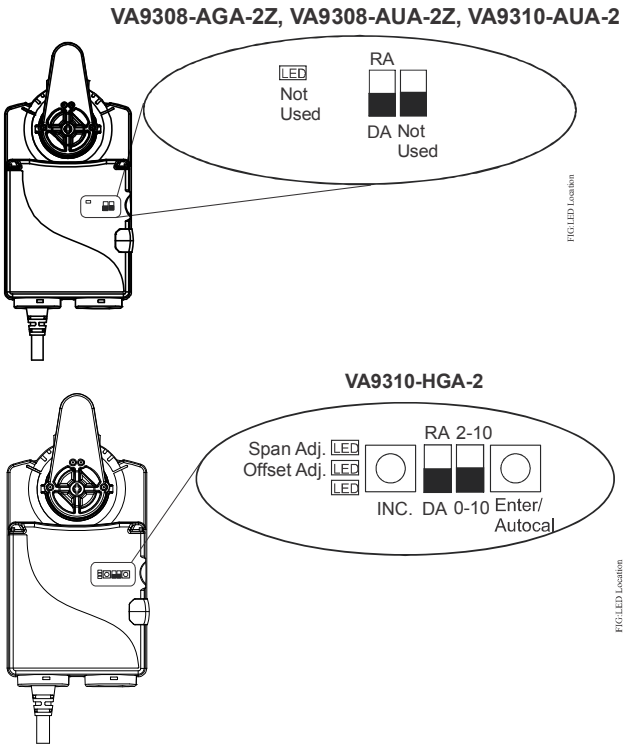


Table 2: DIPs for VA93xx-AGA-2Z, VA93xx-AUA-2Z, VA93xx-AUA-2

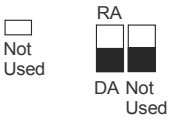
Command Signal	Feedback Signal	Settings for User Interface
Floating or On/Off	Direct	
Floating or On/Off	Reverse	

Table 3: DIP Switch Settings for VA9310-HGA-2

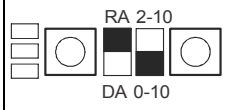
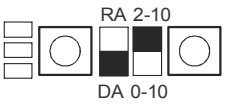
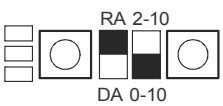
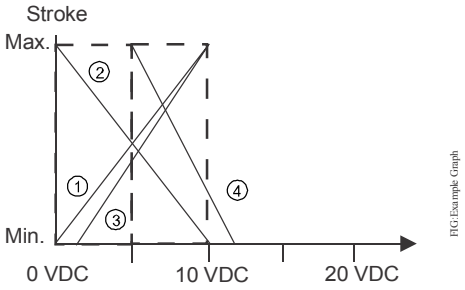
Example	Command Signal	Feedback Signal	Settings for User Interface
1	DC 0 to 10 V	Direct DC 0 to 10 V	
2	DC 0 to 10 V	Reverse DC 0 to 10 V	
3	DC 2 to 10 V	Direct DC 2 to 10 V	
	AC 24 V	—	
4	Offset = 5 Span = 7	Reverse DC 10 to 2 V	

Figure 5: Graphed Examples of Table 3 Command Signals



Mounting Options

VA9300 Series Actuators are mounted directly to the valve or with the M9000-561 Thermal Barrier when the high temperature fluid or low pressure steam are used or additional spacing for insulation is needed.

VA9310 Series Actuators can be easily converted into M9310 Series Actuators using the M9310-600 Coupler.

Optional External Switch Kit

For control requiring line-voltage-capable switches, an optional switch kit can couple to the actuator. The switch kit provides independent and continuously adjustable switch points throughout the full range of the actuator stroke. Auxiliary switches are double insulated so an electrical ground is not required.

Optional External Potentiometer Kit

For control requiring potentiometer feedback, the optional external potentiometer kit can couple to the actuator. The potentiometer kit provides a resistive signal proportional to the degree of rotation.

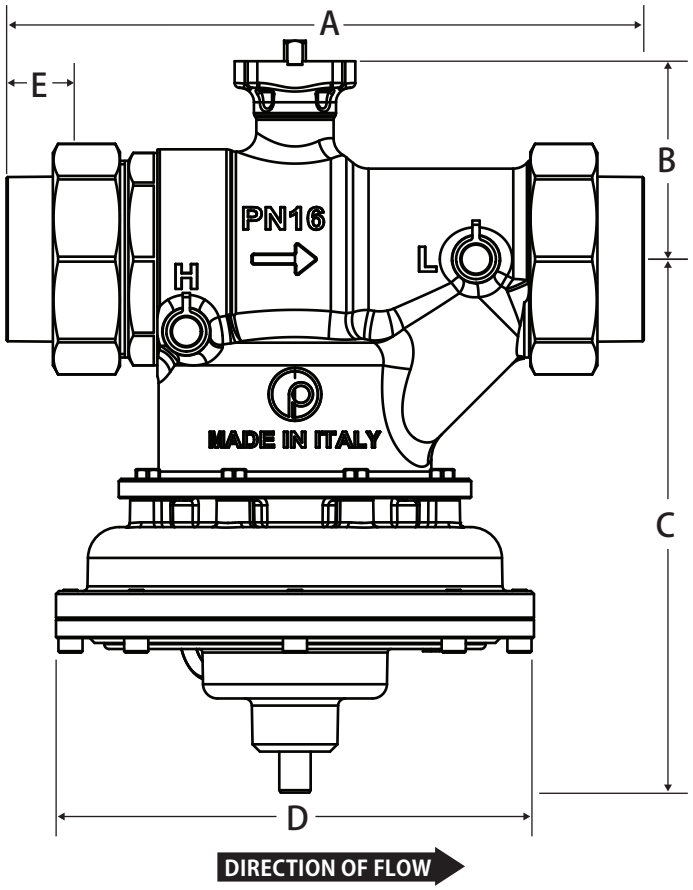
VA9310-xxx-x Electric Non-Spring Return Actuators

Product Description	**VA9310-HGA-x:** On/Off and Floating mode	**VA9310-HGA-x:** Proportional mode	**VA9310-GUA-x:** Proportional mode
Power Requirements	AC 24 V ±20% at 50/60 Hz, Class 2 (North America) or SELV (Europe), 4.7 VA running. DC 24 V ±10% Class 2 (North America) or SELV (Europe), 1.3 W running.		Nominal AC 120 V at 60 Hz: 0.05 A running
Transformer Sizing Requirements	≥6.5 VA		—
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V ±10% Class 2 (North America) or SELV (Europe)	DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor Offset: DC 0 V to 10 V SPAN: DC 2 V to 10 V	AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz
Control Impedance	4.7k ohm	100k ohm	Voltage Control: 100k ohm Current Control: 0.5k ohm
Feedback Signal	—	DC 0 (2) to 10 V	
Rotation Range	Mechanically limited to 95° ±3°		
Rotation Time for 90° of Travel	35 seconds, constant for all operating conditions		
Rotation Time Auto-calibration	35 seconds		
Cycles	100,000 full stroke cycles; 2,500,000 repositions		60,000 full stroke cycles; 1,500,000 repositions
Audible Noise	<35 dBA at 0 lb·in to 90 lb·in (10 N·m) load, at a distance of 39-13/32 in. (1 m)		
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG cable (0.75 mm²) conductors and 0.25 in. (6 mm) ferrule ends		
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector (optional with the M9310-HGA-2)		
Ambient Conditions	**Operating:** -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing **Storage:** -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing		
Fluid Temperature Limits (Actuator and Valve Assembly)	**VG12x1 and VG18x1 Series:** 23°F to 203°F (-5°C to 95°C) **VG12x5 and VG18x5 Series:** -22°F to 212°F (-30°C to 100°C) **VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed:** -22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) saturated steam		
Enclosure	IP54/NEMA 5		
Shipping Weight	2 lb (0.9 kg)		
Compliance	**United States:** UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code. **Canada:** UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.		
CE	**Europe:** CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.		
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant		

Pressure Independent Control Valve

Pressure Regulating Cartridge • Rotary Control Valve • Manual Shutoff• Double Union • 230 WOG

85 Series



Features

- 5-58 PSID operating range
- +/- 5% accuracy up to 15 PSID
- Two pressure / temperature (PT) test ports
- Location tag
- ANSI class IV leakage rate
- 100% leak tested
- Control Valve Stroke: 90°
- Rangeability: >100

Pressure and Temperature Rating

- 230 WOG
- 15 - 250°F

Accepted Actuator Manufacturers

- HCi
- Johnson Controls

Smart Part Number Ordering Guide

T85-DFF-39.6

T85	D	F	F	26.4

Valve Size	Body Type	Body Type	Max Flow Rate (GPM)
D 1-1/4"	F FNPT	F FNPT	26.4
E 1-1/2"			39.6
F 2"			52.8
			79.3

Material Specifications

Part	Material
Body	Ductile Iron
Regulating Device	High Resistance Polymer, EPDM, 303 Stainless Steel
Control Valve	Brass - CW614N, 18/8 Stainless Steel
Stem	Brass - CW602N
O-rings	EPDM
Manual Shut-Off	Brass - CW614N

Dimensions

Size	A	B	C	D	E
1-1/4"	9.14	3.45	6.9	6.24	1.06
1-1/2"	9.14	3.45	6.9	6.24	1.06
2"	10.65	3.73	8.68	7.81	1.27

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer,birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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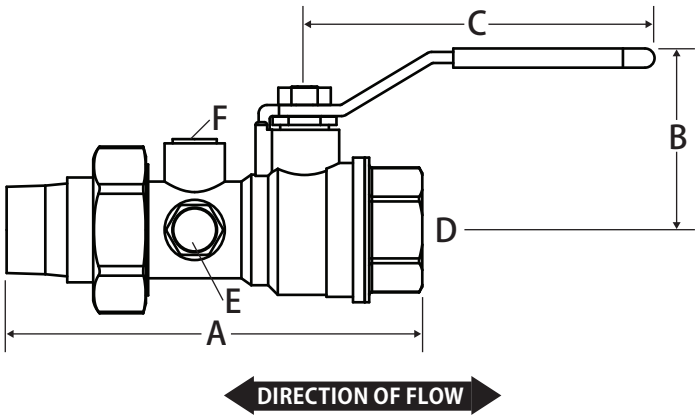
Combination Ball Valve

Isolation Ball Valve • Union • 600 WOG

NT



Features

- Pressure / temperature (PT) test ports
- Additional accessory tap
- Triple sealing stem with 2 Viton® o-rings and Teflon® seal
- Blow out proof stem
- 100% leak tested
- Made in Italy
- Leakproof steam - Lifetime warranty

Pressure and Temperature Rating

- 600 WOG
- 325°F Max

Material Specifications

Part	Material
Body	Brass - CW617N
End Connection	Brass - CW617N
Ball	Chrome Plated Brass -CW617N
Seat (2)	Virgin PTFE
Stem	Brass - CW614N
Packing	Virgin PTFE
Stem O-ring (2)	Viton®
Packing Gland	Brass - CW614N
Handle	Steel - Geomet® Plated
Handle Nut	Steel - Geomet® Plated
Union O-ring	Viton®
Tail Piece	Brass - CW617N
Union Nut	Brass - CW617N

Smart Part Number Ordering Guide

NT-CFRF-MX

NT	C	F	RF	M	X

Valve Size

A	1/2"
B	3/4"
C	1"
D	1-1/4"
E	1-1/2"
F	2"

Body Type

F	FNPT
C	SWT

Tailpiece Size and Type

No Reduction	
F	FNPT
M	MNPT
C	SWT
Single Reduction*	
RF	FNPT
RM	MNPT
RC	SWT
Double Reduction**	
2RF	FNPT
2RM	MNPT
2RC	SWT

*Only available on 3/4" - 2" valves
**Only available on 1" - 2" valves

Optional

Optional Accessories

X	Extended Handle, PT Port, and Accessories
V	Manual Air Vent
B	Ball Valve Air Vent
M	Memory Stop
Q	Blowdown / Drain

Dimensions

Size	A*	B	C	D	E	F	Cv
1/2"	4.68	1.53	2.95	0.59	0.25	0.25	16.82
3/4"	4.73	1.93	3.74	0.79	0.25	0.25	34.80
1"	5.44	2.40	4.72	1.00	0.25	0.25	52.20
1-1/4"	6.45	2.59	4.72	1.25	0.37	0.25	112.52
1-1/2"	7.10	3.22	5.90	1.57	0.37	0.25	174.00
2"	7.68	3.50	5.90	2.00	0.37	0.25	255.20

*Length is for a FNPT x MNPT valve, additional dimensions available upon request

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer,birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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